

CLAIMS

What is claimed is:

1. A method for forming a contact interface, comprising:
providing a substrate including semiconductor material with at least one contact comprising semiconductor material protruding from said substrate;
forming a first layer comprising dielectric material over said semiconductor material and said at least one contact;
forming a second layer comprising polysilicon over said first layer and over at least a portion of a lateral surface of said at least one contact; and
forming a silicide contact at least an interface between said electrically conductive silicidable material and said second layer, including at said portion of said lateral surface.
2. The method of claim 1, wherein said forming said first layer comprises forming silicon dioxide.
3. The method of claim 1, further comprising:
forming a third layer comprising barrier material over said second layer.
4. The method of claim 3, wherein said forming said third layer is effected before said forming said silicide contact.
5. The method of claim 4, further comprising:
exposing at least a portion of said second layer located over said at least one contact, including at least a portion of said second layer located over at least said portion of said lateral surface of said at least one contact through at least said third layer.

6. The method of claim 3, wherein said forming said third layer comprises forming a layer comprising at least one of titanium nitride, tungsten nitride, tungsten silicon nitride, and titanium silicon nitride.

7. The method of claim 3, further comprising forming a fourth layer comprising dielectric material over said second layer prior to said forming said third layer.

8. The method of claim 7, wherein said forming said fourth layer comprises depositing TEOS.

9. The method of claim 7, wherein said forming said fourth layer comprises depositing silicon dioxide.

10. The method of claim 1, wherein said forming said silicide contact comprises disposing electrically conductive silicidable material into contact with at least said portion of said second layer, including at least a portion of said lateral surface.

11. The method of claim 10, wherein said disposing electrically conductive silicidable material comprises disposing cobalt.

12. The method of claim 10, wherein said forming said silicide contact further comprises annealing said electrically conductive silicide material and polysilicon of said portion of said second layer.

13. The method of claim 12, wherein said annealing is effected by heating at least said semiconductor material to a temperature of about 400°C. to about 800°C.

14. The method of claim 12, wherein said annealing is effected by heating at least said semiconductor material to a temperature of about 450°C. to about 600°C.

15. The method of claim 13, further comprising removing an unreacted portion of said electrically conductive silicidable material.

16. The method of claim 15, wherein said removing said unreacted portion is effected without substantially removing reacted electrically conductive silicidable material.

17. The method of claim 16, wherein said removing said unreacted portion is effected without substantially removing said barrier material.

18. The method of claim 15, wherein said removing said unreacted portion is effected with an hydrochloric/peroxide mixture solution.

19. The method of claim 10, further comprising:
forming a third layer comprising barrier material over said second layer.

20. The method of claim 19, wherein said forming said third layer is effected before said forming said silicide contact.

21. The method of claim 20, further including removing said third layer after said forming said silicide contact.

22. The method of claim 21, wherein said removing said third layer is effected without substantially removing said silicide contact.

23. The method of claim 22, wherein said removing said third layer is effected without substantially removing said first layer.

24. The method of claim 21, wherein said removing said third layer comprises substantially completely removing said barrier material.

25. The method of claim 21, wherein said removing is effected with an ammonia/peroxide mixture solution.

26. The method of claim 19, wherein said forming said third layer comprises preventing said electrically conductive silicidable material from reacting with said semiconductor material through at least one of a void and an imperfection in said first layer.